

Chapter 1

Looking at Nature from the Perspective of Physical Sciences

ABSTRACT

This chapter of the book looks at the structure of our environment, including our bodies, by examining the wide spectrum of dimensions of objects. Themes discussed provide some general information about concepts of data, information, and knowledge; dimensions of objects and the ways to look on and interpret them; ways to watch events and how they depend on various factors, especially within a nano-world. These issues are further examined with reference to our bodies and microbes that used to inhabit or attack us. Discussion involves materials such as soft matter, liquid crystals, and colloids, and then events occurring as waves in the quantum world, including the very beginnings of the universe, processes going now in nature, and plans concerning Mars colonization in the near future. Further text tells about carbon in its various forms, dimensions, existing reservoirs, and its role in living organisms.

INTRODUCTION

Current inquiries on nature put emphasis on links between examining matter and investigating light. Also, our knowledge depends on understanding of events occurring in a micro and nano scale, so they came at the center of scientific interest. Many times, objects and events discussed below are beyond the scope of our perception. In such cases knowledge visualization is helpful if not indispensable.

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First, the book looks at our environment by examining the wide spectrum of dimensions of objects. The text explores how studying natural processes is unavoidably linked with applying knowledge and techniques that used to belong to other branches of science. When we look at matter and materials through a magnifying glass, we can see how light and organic matter is interconnected. Materials such as soft matter, liquid crystals, and colloids, and events occurring as waves in the quantum world have been discussed as interconnected processes going now in nature and at the beginnings of the Universe. Understanding of these issues results in developing new materials and technologies, which allows us to plan Mars colonization in the near future.

The interdisciplinary field of materials science examines the relationship between the structure, properties, and performance of the natural and human-made materials at the macroscopic, molecular, atomic, and nano-scale levels. Materials science draws information from physical chemistry, chemistry, applied physics, electronics, engineering, and nanoscience. Developments in photonics shifted approaches toward studying matter in terms of light and wavelengths.

Further text tells about carbon in its various forms, dimensions, existing reservoirs, and its role in living organisms. We can consider carbon in its several aspects, as each one is crucial for our lives:

1. **Carbon as Mineral (Coal):** Carbon in fossil fuels, sources of energy, mining and surface mining in the United States, the environmental cost of surface mining.
2. **Carbon as a Molecule:** The carbon cycle, issues related to carbon monoxide (CO).
3. **Carbon as Soft Matter:** Carbon in computers, biologically inspired models for computing.

The text contains projects and invites the reader to apply graphical thinking. The reader is invited to actively react to the related projects by creating their own solutions.

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